

2

Science Standards
2.2.c. and 2.2.d.

Supports
ELA Standard:
Reading 2.2.4.



Alike and Different

California Education and the Environment Initiative

Approved by the California State Board of Education, 2010

The Education and the Environment Curriculum is a cooperative endeavor of the following entities:

California Environmental Protection Agency
California Natural Resources Agency
Office of the Secretary of Education
California State Board of Education
California Department of Education
California Integrated Waste Management Board

Key Leadership for the Education and Environment Initiative:

Linda Adams, Secretary, California Environmental Protection Agency
Patty Zwarts, Deputy Secretary for Policy and Legislation, California Environmental Protection Agency
Andrea Lewis, Assistant Secretary for Education and Quality Programs, California Environmental Protection Agency
Mark Leary, Executive Director, California Integrated Waste Management Board
Mindy Fox, Director, Office of Education and the Environment, California Integrated Waste Management Board

Key Partners:

Special thanks to **Heal the Bay**, sponsor of the EEI law, for their partnership and participation in reviewing portions of the EEI curriculum.

Valuable assistance with maps, photos, videos and design was provided by the **National Geographic Society** under a contract with the State of California.

Office of Education and the Environment

1001 I Street • Sacramento, California 95812 • (916) 341-6769
<http://www.calepa.ca.gov/Education/EEI/>

© Copyright 2010 by the State of California
All rights reserved.

This publication, or parts thereof, may not be used or reproduced without permission from the
Office of Education and the Environment.

These materials may be reproduced by teachers for educational purposes.



Lesson 1 Adapted to Woodlands

- 1 White Ermine in Snow and After Snowmelt 2
- 2 Mule Deer Fawn With and Without Grass Cover 3

Lesson 2 Traits for Survival

- 3 Mule Deer Buck 4

Lesson 3 Animals That Blend with Their Background

- 4 Brown Ermine in Woodland 5

Lesson 4 Alike but Different

- 5 Color Variation in Cocker Spaniels 6
- 6 Spaniels with Solid Color or Patches: Page 1 7
- 7 Spaniels with Solid Color or Patches: Page 2 8
- 8 Counting Beans 9
- 9 Variations in Populations 10

Lesson 5 Habitat Change and Variations Within Populations

- 10 Healthy Riparian Habitat 11
- 11 Disturbed Riparian Habitat 12
- 12 How Red-winged Blackbirds Treat Cowbird Eggs 13

Assessments

- 13 Elephant Seals 14
- 14 Pipefish 15

VA #1 White Ermine in Snow and After Snowmelt



VA #2 Mule Deer Fawn With and Without Grass Cover



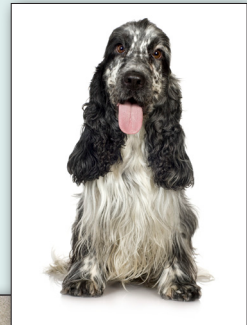
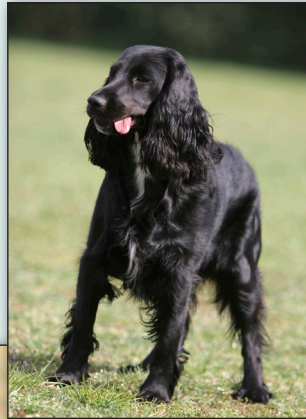
VA #3 Mule Deer Buck



VA #4 Brown Ermine in Woodland



VA #5 Color Variation in Cocker Spaniels



This breed of dog comes in many colors.
Some are one color.
Some have patches.
These dogs have long ears.
They like to hunt birds.
They are medium in size.

VA #6 Spaniels with Solid Color or Patches: Page 1



This black father inherited the solid-color trait from both parents.

This black-and-white mother inherited the patches trait from both parents.

All their puppies will inherit one of each trait.

Will they have a solid color or patches?

All the puppies will be black.



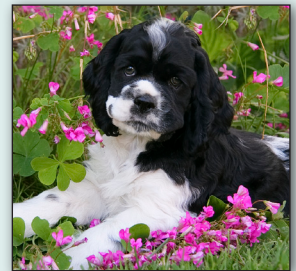
VA #7 Spaniels with Solid Color or Patches: Page 2



One of these spaniels with a solid-color and patches trait becomes a father. The black mother also inherited one of each trait.

Will their puppies have a solid color or patches?

Three out of four will inherit the solid-color trait from at least one parent.



They will be black. One out of four will inherit the patches or mixed-color trait for patches from both parents. It will have patches.

VA #8 Counting Beans

Bean Draw			
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

VA #9 Variations in Populations

1.



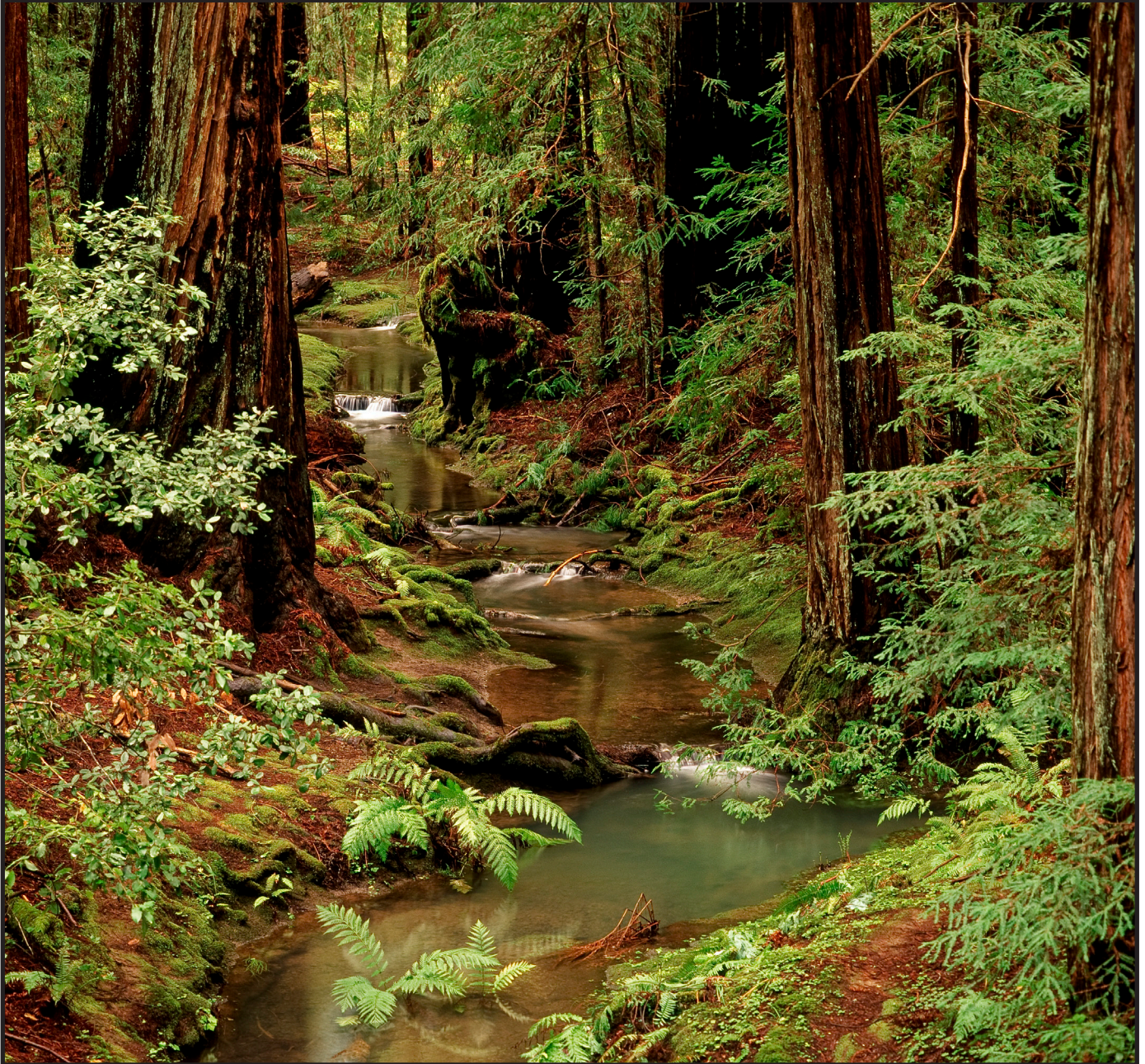
2.



3.



VA #10 Healthy Riparian Habitat



VA #11 Disturbed Riparian Habitat



VA #12 How Red-winged Blackbirds Treat Cowbird Eggs



If you walk by a wetland, you might find a nest with two red-winged blackbird eggs and three cowbird eggs.

Cowbirds and red-winged blackbirds are both in the blackbird family.

Their eggs are the same size. But cowbird eggs have more speckles.



Almost all red-winged blackbirds accept cowbird eggs.

They raise cowbird hatchlings along with their own.



A few red-winged blackbirds inherited a variation.

Some blackbirds reject cowbird eggs.

This lets red-winged blackbirds raise more of their own young.

VA #13 Elephant Seals



Adult elephant seal



Elephant seal pup

VA #14 Pipefish



Pipefish in eelgrass



Pipefish in green seagrass



California STATE BOARD OF
EDUCATION

California Education and the Environment Initiative